

PATENT ABSTRACTS OF JAPAN

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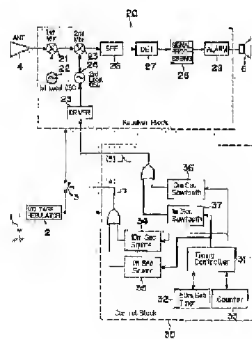
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(21)Application number : 04-094505 (71)Applicant : YUPITERU IND CO LTD

(22)Date of filing : 14.04.1992 (72)Inventor : ONO HISAO

(54) POWER SAVING TYPE MICROWAVE DETECTOR



(57)Abstract:

PURPOSE: To improve the detection sensitivity by repeating the high-sensitive mode long in operating period with large synchronization and the low-sensitive mode short in operating period with small synchronization in the operating period

of a super heterodyne receiver which operates intermittently.

CONSTITUTION: A timing controller 31 starts a 50msec timer 32. When the value of a counter 33 is zero, a square generation circuit 34 for 10msec operation mode and a saw tooth wave generation circuit 36 are triggered. Thereby turning on a power supply switch 3 for 10msec, a reception circuit section 20 is operated, a sweep driver 25 simultaneously sweeps the frequency of a 2nd local oscillator 24. This process is a high-sensitive operating mode having a longer operating time with slow sweep speed of the local oscillator. If the counter 33 is not zero, a square wave generation circuit 35 of 1msec operating mode and a saw tooth wave generation circuit 37 are triggered. Thus, the low- sensitive operating mode short in one operation period and high in the sweep speed of the local oscillator can be obtained.

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CLAIMS

[Claim(s)]

[Claim 1] While supplying electric power to a superheterodyne type receiving circuit intermittently and operating this intermittently A bandwidth predetermined by carrying out the sweep of the output frequency of a local oscillator from a predetermined value to a predetermined value in the period of operation is searched. The control means which is the knot electrotyping microwave detector which detects and reports the microwave included in the band, and makes a high sensitivity mode of operation with 1 time of the long operating time, and the slow sweep rate of said local oscillator, While repeating the control means which makes a low sensibility mode of operation with 1 time of the short operating time, and the quick sweep rate of said local oscillator, and said high sensitivity mode of operation a big period and performing them The knot electrotyping microwave detector characterized by having the control means which repeats said low sensibility mode of operation a small period, and performs it.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to amelioration of the knot electrotyping microwave detector which a receiving circuit is operated intermittently and reduced power consumption especially about the microwave detector which detects and reports the microwave emitted from a measuring machine machine etc.

[0002]

[Description of the Prior Art] The microwave detector constituted so that the microwave discharged from the radar type instrument for measuring speed might be detected and an alarm might be emitted is known from the former. In the case of a common traffic surveillance radar type instrument for measuring speed, the microwave of one band of a 10GHz band (X band), a 24GHz band (K band), and a 35GHz band (Ka band) is used. Moreover, there are a continuous wave type instrument for measuring speed which emits the microwave for radars continuously, and a pulse modulation wave type instrument for measuring speed which emits the microwave by which pulse modulation was carried out.

[0003] The microwave detector which makes the above instruments for measuring speed applicable to detection has the composition of generating an

alarm with a buzzer, an LED lamp, etc., when it discriminates from the microwave of a predetermined band by this receiving circuit centering on a superheterodyne type receiving circuit. In the case of the microwave detector of the usual type which obtains operating power from the exterior, a superheterodyne type receiving circuit and other digital disposal circuits are always operating. However, in order in the case of the small microwave detector which operates with the power source of small capacity, such as a built-in cell and a solar battery, to make power consumption as small as possible and to offer the long duration guarantee of the stable actuation, it has the composition of supplying electric power to a receiving circuit and other main digital disposal circuits intermittently, and operating this intermittently.

[0004] Generally the microwave detector of the knot electrotyping with which the microwave detector of a type also usually operates intermittently which operates continuously has also secured the receiving bandwidth predetermined by carrying out the sweep of the output frequency of the local oscillator in a superheterodyne type receiving circuit by predetermined within the limits. In the case of the microwave detector of a knot electrotyping, in 1 time of a period of operation, the sweep of the output frequency of a local oscillator is only once carried out from a predetermined value to a predetermined value. Usually, in the microwave detector of a type, the sweep of a local oscillator is performed repeatedly.

[0005]

[Problem(s) to be Solved by the Invention] In a knot electrotyping microwave detector, power consumption becomes small, so that the operating time over the period of an intermittent control action is made small. With the typical configuration of this kind of microwave detector, the period of 10msec of operation and the idle period of 490msec(s) are repeated by turns. With this configuration, although the microwave which is not modulated from a continuous wave type instrument for measuring speed is detectable satisfactory at all, the probability discharged from a pulse modulation wave type instrument for

measuring speed to detect the microwave of the pulse width of 50msec extent, for example will become very small. That is, since the period of 10msec(s) of operation is repeated with the period of 500msec(s) in the aforementioned example, the probability for the antenna input and reception actuation period of the microwave by which pulse modulation was carried out by 50msec width of face to lap is very small.

[0006] In order to enable it to detect certainly the microwave to which pulse modulation of the width-of-face 50msec was carried out, it is necessary to set the repeat period of an intermittent control action to less than 50 msec. In setting the period of an intermittent control action to 50msec(s), and having left the operating time 10msec as aforementioned, power consumption increases more sharply than the aforementioned example. The operating time must be made into 1msec extent if it is going to make power consumption the same as the aforementioned example.

[0007] In a knot electrotyping microwave detector, the sweep of the frequency of a local oscillator is carried out from a predetermined value to a predetermined value so that a receiving bandwidth required of 1 time of a period of operation as mentioned above may be obtained. I hear that carrying out the sweep of the frequency range which was carrying out the sweep by the operating time of 10msec(s) by the operating time of 1msec increases a sweep rate 10 times, and there is. Improvement in the speed of a sweep rate is restricted by the property of the intermediate frequency filter in a superheterodyne type receiving circuit, the filter of the audio stage after a detection output, etc. That is, if a sweep rate is made quick to some extent above, receiving sensibility will fall to a sweep rate in inverse proportion.

[0008] Generally, the output of a pulse modulation wave type instrument for measuring speed is large, and the output of a continuous wave type instrument for measuring speed is small. When making a sweep rate very quick as mentioned above and reducing receiving sensibility, even if the microwave with a big output by which pulse modulation was carried out is detectable, the detection

sensitivity to the microwave non-become irregular becomes low too much, and dependability falls.

[0009] This invention was made in view of the conventional trouble mentioned above, and that purpose is in reconciling maintaining high detection sensitivity in a knot electrotyping microwave detector, and making power consumption as small as possible.

[0010]

[Means for Solving the Problem] Then, it sets to the knot electrotyping microwave detector which a superheterodyne type receiving circuit is boiled [microwave detector] intermittently and operates it in this invention. The control means which makes a high sensitivity mode of operation with 1 time of the long operating time, and the slow sweep rate of said local oscillator, The control means which makes a low sensibility mode of operation with 1 time of the short operating time and the quick sweep rate of said local oscillator, and the control means which repeats said low sensibility mode of operation a small period, and performs it while repeating said high sensitivity mode of operation a big period and performing it were established.

[0011]

[Function] Although the sensibility to an antenna input of said low sensibility mode of operation is low, the microwave with a comparatively big output by which pulse modulation was carried out is detectable by the high probability in a time-axis repeating this a small period and performing it. It is certainly receivable by performing said high sensitivity mode of operation with the high sensibility to an antenna input a big period to the microwave which is not modulated with a comparatively small output. That is, only compared with the configuration which repeats a low sensibility mode of operation a small period, detection sensitivity and dependability improve sharply. Moreover, compared with the configuration which repeats a high sensitivity mode of operation a small period, power consumption can be reduced sharply.

[0012]

[Example] Drawing 1 shows the outline configuration of the knot electrotyping microwave detector by one example of this invention, and shows that actuation to drawing 2 and drawing 3 . The circuitry of this microwave detector is divided into the receiving-circuit section 20 and the control circuit section 30 which are explained in full detail below. Although the output of the power source 1 which consists of a built-in cell or a solar battery is stabilized by the voltage regulator 2 and firm gas is carried out to the control circuit section 30, it is intermittently supplied to the receiving-circuit section 20 by turning on and off of the electric supply switch 3.

[0013] The receiving-circuit section 20 includes the double superheterodyne type receiving circuit. Frequency mixing of the antenna input by the horn antenna 4 and the output of the 1st local oscillator 22 is carried out with the 1st mixer 21. Frequency mixing of the 1st intermediate frequency signal and the output of the 2nd local oscillator 24 which were obtained by this is carried out with the 2nd mixer 23, and the output is inputted into a detector circuit 27 through the intermediate frequency filter 26. This receiving-circuit section 20 operates intermittently so that it may state below, and the sweep of the output of the 2nd local oscillator 24 is carried out to 1 time of that period of operation by the sweep driver 25 from a predetermined value to a predetermined value. A predetermined receiving bandwidth is searched in 1 time of a receiving period by this. It discriminates from whether the digital disposal circuit 28 supervised the output of a detector circuit 27, and the input signal of microwave was during the detection output. And when a microwave input signal is detected, the alarm circuit 29 is operated, an alarm sound is generated by the loudspeaker 5, or an LED lamp (illustration abbreviation) is blinked.

[0014] The control circuit section 30 is a configuration centering on the timing controller 31, and controls the intermittent control action of the receiving-circuit section 20 to state below. In the control circuit section 30, it has the square wave generating circuit 34 which generates the square wave pulse of the width of face of 10msec(s), and the square wave generating circuit 35 which generates the

square wave pulse of the pulse width of 1msec. The ON drive of the electric supply switch 3 is carried out by the pulse signal generated from either of these two circuits 34 and 35, and the operating time of 10msec or the operating time of 1msec is made. Moreover, the sweep driver 25 which carries out the sweep of the frequency of the 2nd local oscillator 24 is controlled by the sawtooth wave signal from the control circuit section 30. The circuit 36 which generates the sawtooth wave signal of 10msec width of face, and the circuit 37 which generates the sawtooth wave signal of 1msec width of face are included in the control circuit section 30, and the sawtooth wave signal from either is supplied to the sweep driver 25 synchronizing with the square wave pulse signal which controls said electric supply switch 3. Drawing 2 shows the control procedure by the timing controller 31, and shows the wave of the square wave pulse signal (A) supplied to the electric supply switch 3, and the sawtooth wave signal (B) supplied to the sweep driver 25, and timing to drawing 3 .

[0015] The flow of actuation of the microwave detector shown in drawing 1 according to the flow chart of drawing 2 is explained. The timing controller 31 clears a counter 33 to zero first, and then starts the timer 32 of 50msec(s) (steps 201 and 202). The value of a counter 33 confirms [zero or] whether that is right (step 203), next, if it is zero, step 204 will be performed, and step 205 will be performed if it is not zero.

[0016] At step 204, the trigger of the square wave generating circuit 34 and the sawtooth wave generating circuit 36 for 10msec modes of operation is carried out. While the electric supply switch 3 serves as ON by this only in 10 msec and said receiving-circuit section 20 operates only in the time amount, the sweep driver 25 carries out the sweep of the frequency of the 2nd local oscillator 24 from a predetermined value to a predetermined value between the operating-time 10msec. It is a high sensitivity mode of operation with this long [1 time of the operating time], and the slow sweep rate of a local oscillator.

[0017] At step 205, the trigger of the square wave generating circuit 35 and the sawtooth wave generating circuit 37 for 1msec modes of operation is carried out.

While only 1 msec serves as ON and the electric supply switch 3 operates said receiving-circuit section 20 by this, the sweep driver 25 carries out the sweep of the frequency of the 2nd local oscillator 24 to the period of the 1msec of operation from a predetermined value to a predetermined value. It is a low sensibility mode of operation with this short [1 time of the operating time], and the quick sweep rate of a local oscillator.

[0018] At step 206 following steps 204 or 205, a counter 33 is incremented, and in continuing step 207, if the deadline of is passed, it will judge [waiting and] whether the value of a counter 33 is 10 at step 208, until the 50msec timer 32 passes the deadline of. If the value of a counter 33 is not 10, if the value of return and a counter 33 is 10, it will return to step 202 at the first step 201. By the above explanation, the receiving-circuit section 20 operates intermittently with the period of 50msec(s) so that clearly. And only 1 time in 10 times of periods of operation becomes a high sensitivity mode of operation, and nine actuation which remains serves as a low sensibility mode of operation.

[0019]

[Effect of the Invention] since it constituted from a knot electrotyping microwave detector concerning this invention so that a low sensibility mode of operation with 1 time of the short operating time might be repeated a small period and might be performed while 1 time of the operating time repeated the long high sensitivity mode of operation the big period and performed it as explained to the detail above -- the microwave which is not modulated from a continuous wave type instrument for measuring speed with a comparatively small output etc. -- receiving -- this is certainly detectable with a high sensitivity mode of operation. Moreover, to the short microwave of the duration by which pulse modulation was carried out from the pulse modulation type instrument for measuring speed with a comparatively big output etc., this is certainly detectable with the low sensibility mode of operation which operates frequently a short period. Therefore, reliable detection actuation is realizable by high sensitivity to any of the microwave non-become irregular and pulse modulation microwave, making sufficiently small the

ratio of the operating time over the quiescent time of operation, and keeping power consumption small.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the outline block diagram of the knot electrotyping microwave detector by one example of this invention.

[Drawing 2] It is the flow chart which shows actuation of the microwave detector same as the above controlled by the timing controller 31 in drawing 1 .

[Drawing 3] It is drawing showing the wave of a control signal (A) and (B) and timing in drawing 1 .

[Description of Notations]

1 Power Source

3 Electric Supply Switch

4 Horn Antenna

24 2nd Local Oscillator

25 Sweep Driver

31 Timing Controller

34 10Msec Square-wave Oscillator

35 1Msec Square-wave Oscillator

36 10Msec Sawtooth Wave Generating Circuit

37 1Msec Sawtooth Wave Generating Circuit

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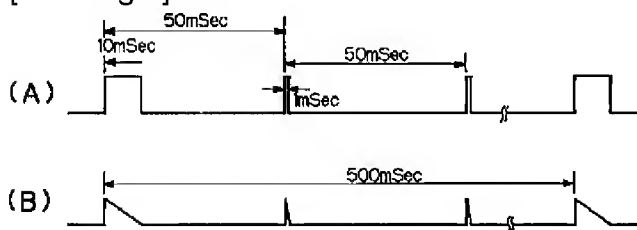
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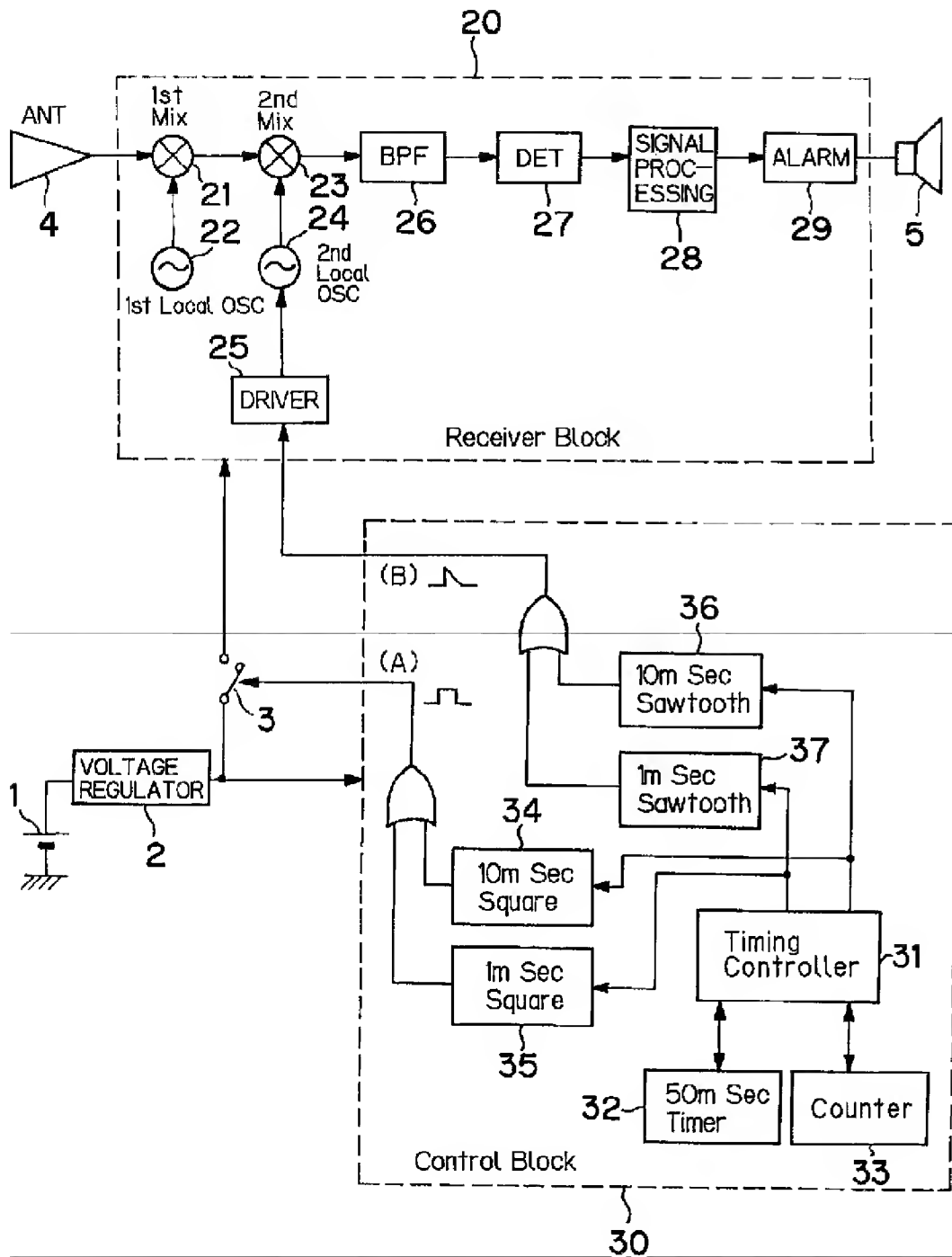
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DRAWINGS

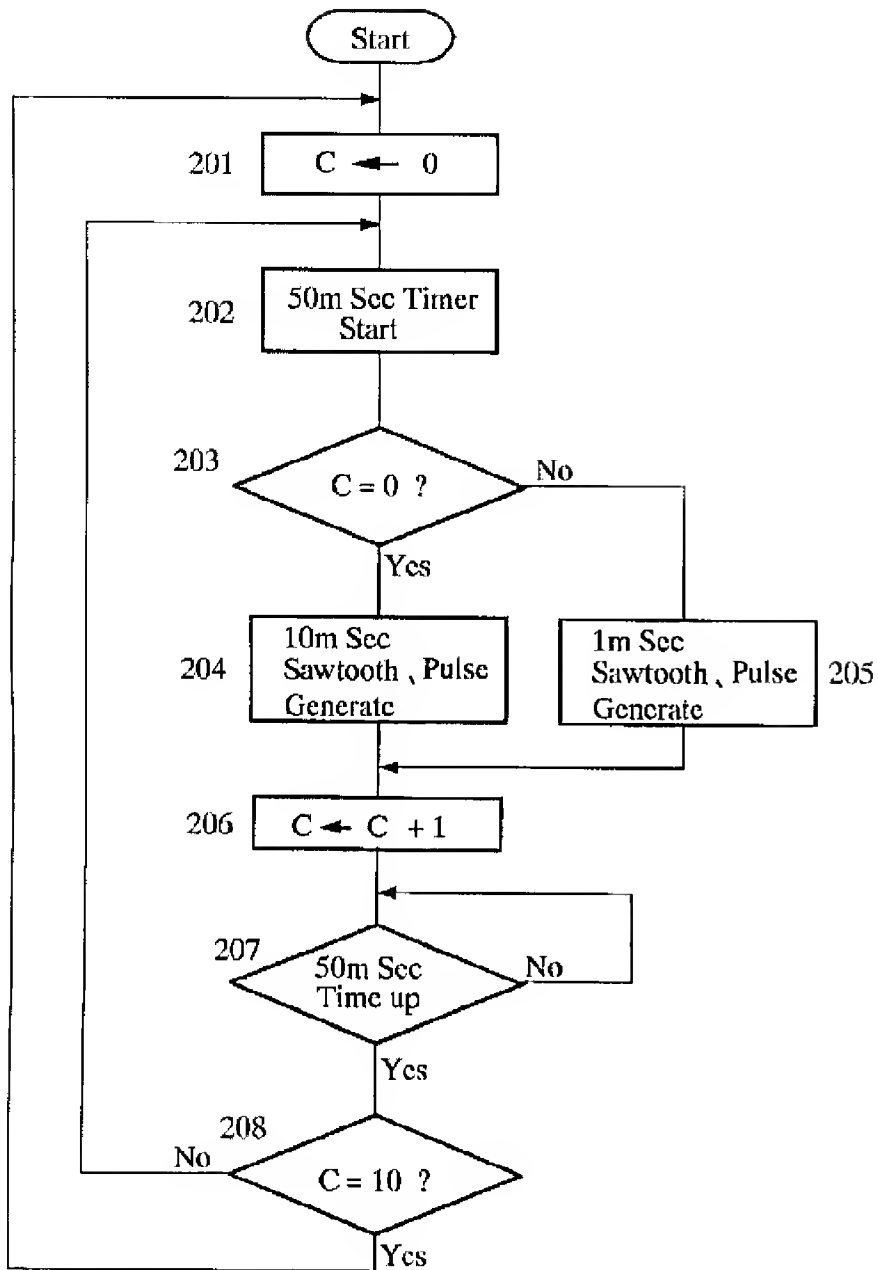
[Drawing 3]



[Drawing 1]



[Drawing 2]



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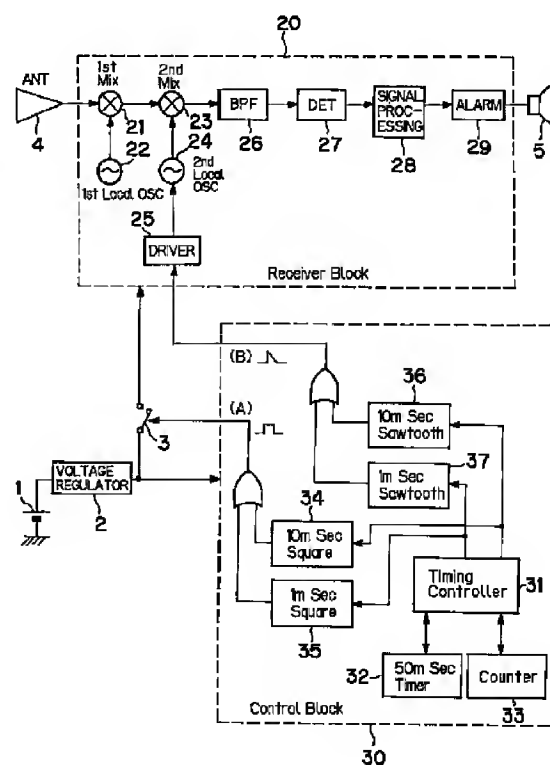
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(54) 【発明の名称】 節電型マイクロ波検出器

(57) 【要約】

【目的】 スーパーヘテロダイン式受信回路を間欠的に動作させるとともに、1回の動作期間において局部発振器の出力周波数を所定値から所定値までスイープする節電型マイクロ波検出器において、消費電力を低く保ちながら、無変調マイクロ波およびパルス変調マイクロ波のいずれに対しても高い検出感度を実現する。

【構成】 1回の動作時間が長い高感度動作モードを大きな周期で繰り返し実行するとともに、1回の動作時間が短い低感度動作モードを小さな周期で繰り返し実行する。



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【特許請求の範囲】

【請求項1】 スーパーヘテロダイン式受信回路に間欠的に給電してこれを間欠的に動作させるとともに、その動作期間において局部発振器の出力周波数を所定値から所定値までスイープすることで所定のバンド幅をサーチし、そのバンドに含まれるマイクロ波を検出して報知する節電型マイクロ波検出器であって、

1回の動作時間が長くて前記局部発振器のスイープ速度が遅い高感度動作モードを作り出す制御手段と、

1回の動作時間が短くて前記局部発振器のスイープ速度が速い低感度動作モードを作り出す制御手段と、

前記高感度動作モードを大きな周期で繰り返し実行するとともに、前記低感度動作モードを小さな周期で繰り返し実行する制御手段と、

を備えたことを特徴とする節電型マイクロ波検出器。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 この発明は、計測機器などから発せられるマイクロ波を検出して報知するマイクロ波検出器に関し、特に、受信回路を間欠的に動作させて消費電力を低減するようにした節電型マイクロ波検出器の改良に関する。

【0002】

【従来の技術】 レーダー式スピード測定器から発射されたマイクロ波を検出してアラームを発するように構成されたマイクロ波検出器が従来から知られている。一般的な交通監視用レーダー式スピード測定器の場合、10GHz帯(Xバンド)、24GHz帯(Kバンド)、35GHz帯(Kaバンド)のいずれかの帯域のマイクロ波を使用している。また、レーダー用のマイクロ波を連続的に放射する連続波式スピード測定器と、パルス変調されたマイクロ波を放射するパルス変調波式スピード測定器とがある。

【0003】 前記のようなスピード測定器を検出対象とするマイクロ波検出器はスーパーヘテロダイン式受信回路を中心とし、この受信回路により所定のバンドのマイクロ波を弁別したときにブザーやLEDランプなどによってアラームを発生する構成となっている。外部から動作電力を得る通常タイプのマイクロ波検出器の場合、スーパーヘテロダイン式受信回路やその他の信号処理回路は常時動作している。しかし内蔵電池や太陽電池などの小容量の電源で動作する小型のマイクロ波検出器の場合、消費電力をできるだけ小さくして安定な動作を長時間保証するために、受信回路およびその他の主要な信号処理回路に間欠的に給電してこれを間欠的に動作させる構成になっている。

【0004】 連続的に動作する通常タイプのマイクロ波検出器も、間欠的に動作する節電型のマイクロ波検出器も、一般に、スーパーヘテロダイン式受信回路における局部発振器の出力周波数を所定範囲内でスイープするこ

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とで所定の受信バンド幅を確保している。節電型のマイクロ波検出器の場合、1回の動作期間において局部発振器の出力周波数を所定値から所定値まで1度だけスイープする。通常タイプのマイクロ波検出器では局部発振器のスイープが繰り返し行われている。

【0005】

【発明が解決しようとする課題】 節電型マイクロ波検出器では、間欠動作の周期に対する動作時間を小さくするほど消費電力が小さくなる。この種のマイクロ波検出器の典型的な構成では、10msecの動作期間と490msecの休止期間を交互に繰り返すようになっている。この構成では、連続波式スピード測定器からの無変調のマイクロ波を何ら問題なく検出することができるが、パルス変調波式スピード測定器から発射される例えば50msec程度のパルス幅のマイクロ波を検出する確率は非常に小さくなってしまふ。つまり、前記の例では10msecの動作期間が500msecの周期で繰り返されるので、50msec幅でパルス変調されたマイクロ波のアンテナ入力と受信動作期間とが重なる確率が非常に小さい。

【0006】 幅50msecのパルス変調されたマイクロ波を確実に検出できるようにするには、間欠動作の繰り返し周期を50msec以内にしなければならない。間欠動作の周期を50msecとし、動作時間を前記の通り10msecのままにしたのでは、消費電力が前記の例より大幅に増加する。消費電力を前記の例と同じにしようとするならば、動作時間を1msec程度にしなければならない。

【0007】 節電型マイクロ波検出器では前述のように1回の動作期間で必要な受信バンド幅を得るように、局部発振器の周波数を所定値から所定値までスイープさせる。10msecの動作時間でスイープしていた周波数範囲を1msecの動作時間でスイープするということは、スイープ速度を10倍にすることである。スーパーヘテロダイン式受信回路における中間周波フィルタや検波出力後のオーディオ段のフィルタなどの特性によりスイープ速度の高速化は制限される。つまり、ある程度以上にスイープ速度を速くすると、受信感度がスイープ速度に反比例的に低下してしまう。

【0008】 一般にパルス変調波式スピード測定器の出力は大きく、連続波式スピード測定器の出力は小さい。前記のようにスイープ速度を非常に速くして受信感度を低下させた場合、出力の大きなパルス変調されたマイクロ波は検出できても、無変調のマイクロ波に対する検出感度が低くなり過ぎ、信頼性が低下する。

【0009】 この発明は前述した従来の問題点に鑑み込まれたもので、その目的は、節電型マイクロ波検出器において高い検出感度を維持することと、消費電力をできるだけ小さくすることとを両立させることにある。

【0010】

【課題を解決するための手段】そこでこの発明では、スーパーヘテロダイク式受信回路を間欠的に動作させる節電型マイクロ波検出器において、1回の動作時間が長くて前記局部発振器のスweep速度が遅い高感度動作モードを作り出す制御手段と、1回の動作時間が短くて前記局部発振器のスweep速度が速い低感度動作モードを作り出す制御手段と、前記高感度動作モードを大きな周期で繰り返し実行するとともに、前記低感度動作モードを小さな周期で繰り返し実行する制御手段とを設けた。

【0011】

【作用】前記低感度動作モードはアンテナ入力に対する感度は低い、これを小さな周期で繰り返し実行することで、比較的出力の大きなパルス変調されたマイクロ波を時間軸において高確率で検出することができる。比較的出力の小さな無変調のマイクロ波に対してはアンテナ入力に対する感度が高い前記高感度動作モードを大きな周期で実行することで確実に受信することができる。つまり低感度動作モードを小さな周期で繰り返すだけの構成に比べて検出感度、信頼性が大幅に向上する。また高感度動作モードを小さな周期で繰り返す構成に比べて消費電力を大幅に低減することができる。

【0012】

【実施例】図1はこの発明の一実施例による節電型マイクロ波検出器の概略構成を示し、図2および図3にその動作を示している。このマイクロ波検出器の回路構成は以下に詳述する受信回路部20と制御回路部30とに分かれる。内蔵電池あるいは太陽電池などからなる電源1の出力は電圧レギュレータ2で安定化されて、制御回路部30には常時供給されるが、受信回路部20には給電スイッチ3のオン・オフにより間欠的に供給される。

【0013】受信回路部20はダブルスーパーヘテロダイク式受信回路を含んでいる。ホーンアンテナ4によるアンテナ入力と第1局部発振器22の出力とが第1ミキサ21にて周波数混合される。これによって得られた第1中間周波信号と第2局部発振器24の出力とが第2ミキサ23にて周波数混合され、その出力が中間周波フィルタ26を経て検波回路27に入力される。この受信回路部20は以下に述べるように間欠的に動作し、その1回の動作期間にスweepドライバ25によって第2局部発振器24の出力が所定値から所定値までスweepされる。これによって所定の受信バンド幅を1回の受信期間でサーチする。信号処理回路28は検波回路27の出力を監視し、検波出力中にマイクロ波の受信信号があったか否かを弁別する。そして、マイクロ波受信信号が検出されたときにはアラーム回路29を動作させ、スピーカ5によってアラーム音を発生したりLEDランプ（図示省略）を点滅させたりする。

【0014】制御回路部30はタイミングコントローラ31を中心とした構成で、次ぎに述べるように受信回路部20の間欠動作を制御する。制御回路部30には10

msecの幅の方形波パルスが発生する方形波発生回路34と、1msecのパルス幅の方形波パルスが発生する方形波発生回路35とを有する。この2つの回路34、35のいずれかから発生するパルス信号によって給電スイッチ3がオン駆動され、10msecの動作時間あるいは1msecの動作時間が作り出される。また、第2局部発振器24の周波数をスweepするスweepドライバ25は、制御回路部30からののこぎり波信号によってコントロールされる。制御回路部30には10msec幅ののこぎり波信号を発生する回路36と、1msec幅ののこぎり波信号を発生する回路37とが含まれており、いずれかからののこぎり波信号が前記給電スイッチ3を制御する方形波パルス信号と同期してスweepドライバ25に供給される。図2はタイミングコントローラ31による制御手順を示し、図3には給電スイッチ3に供給される方形波パルス信号(A)と、スweepドライバ25に供給されるのこぎり波信号(B)の波形およびタイミングを示している。

【0015】図2のフローチャートに従って図1に示すマイクロ波検出器の動作の流れを説明する。タイミングコントローラ31はまずカウンタ33をゼロにクリアし、次ぎに50msecのタイマ32をスタートする（ステップ201、202）。次ぎにカウンタ33の値がゼロかそうでないかをチェックし（ステップ203）、ゼロであればステップ204を実行し、ゼロでなければステップ205を実行する。

【0016】ステップ204では、10msec動作モード用の方形波発生回路34とのこぎり波発生回路36をトリガする。これにより給電スイッチ3が10msecだけオンとなり、前記受信回路部20がその時間だけ動作するとともに、スweepドライバ25がその動作時間10msecの間に第2局部発振器24の周波数を所定値から所定値までスweepさせる。これが1回の動作時間が長くて局部発振器のスweep速度が遅い高感度動作モードである。

【0017】ステップ205では1msec動作モード用の方形波発生回路35とのこぎり波発生回路37をトリガする。これにより給電スイッチ3が1msecだけオンとなり、前記受信回路部20を動作させるとともに、その1msecの動作期間にスweepドライバ25が第2局部発振器24の周波数を所定値から所定値までスweepさせる。これが1回の動作時間が短くて局部発振器のスweep速度が速い低感度動作モードである。

【0018】ステップ204または205に続くステップ206では、カウンタ33をインクリメントし、続くステップ207では50msecタイマ32がタイムアップするまで待ち、タイムアップしたならばステップ208でカウンタ33の値が10になっているか否かを判定する。カウンタ33の値が10でなければステップ202に戻り、カウンタ33の値が10であれば最初のス

トップ201に戻る。以上の説明で明らかなように、受信回路部20は50msecの周期で間欠的に動作する。そして10回の動作期間のうちの1回だけが高感度動作モードとなり、残る9回の動作が低感度動作モードとなる。

【0019】

【発明の効果】以上詳細に説明したように、この発明に係る節電型マイクロ波検出器では、1回の動作時間が長い高感度動作モードを大きな周期で繰り返し実行するとともに、1回の動作時間が短い低感度動作モードを小さな周期で繰り返し実行するように構成したので、比較的输出の小さな連続波式スピード測定器などからの無変調のマイクロ波に対しては高感度動作モードにより確実にこれを検出することができる。また比較的输出の大きなパルス変調式スピード測定器などからのパルス変調された継続時間の短いマイクロ波に対しては、短い周期で頻繁に動作する低感度動作モードにより確実にこれを検出することができる。従って、動作休止時間に対する動作時間の比率を十分小さくして消費電力を小さく保ちながら、無変調マイクロ波およびパルス変調マイクロ波のい

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ことができる

【図面の簡単な説明】

【図1】この発明の一実施例による節電型マイクロ波検出器の概略構成図である。

【図2】図1におけるタイミングコントローラ31によって制御される同上マイクロ波検出器の動作を示すフローチャートである。

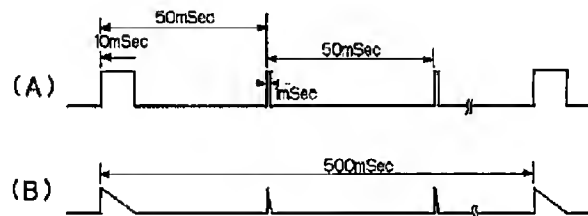
【図3】図1における制御信号(A)(B)の波形とタイミングを示す図である。

【符号の説明】

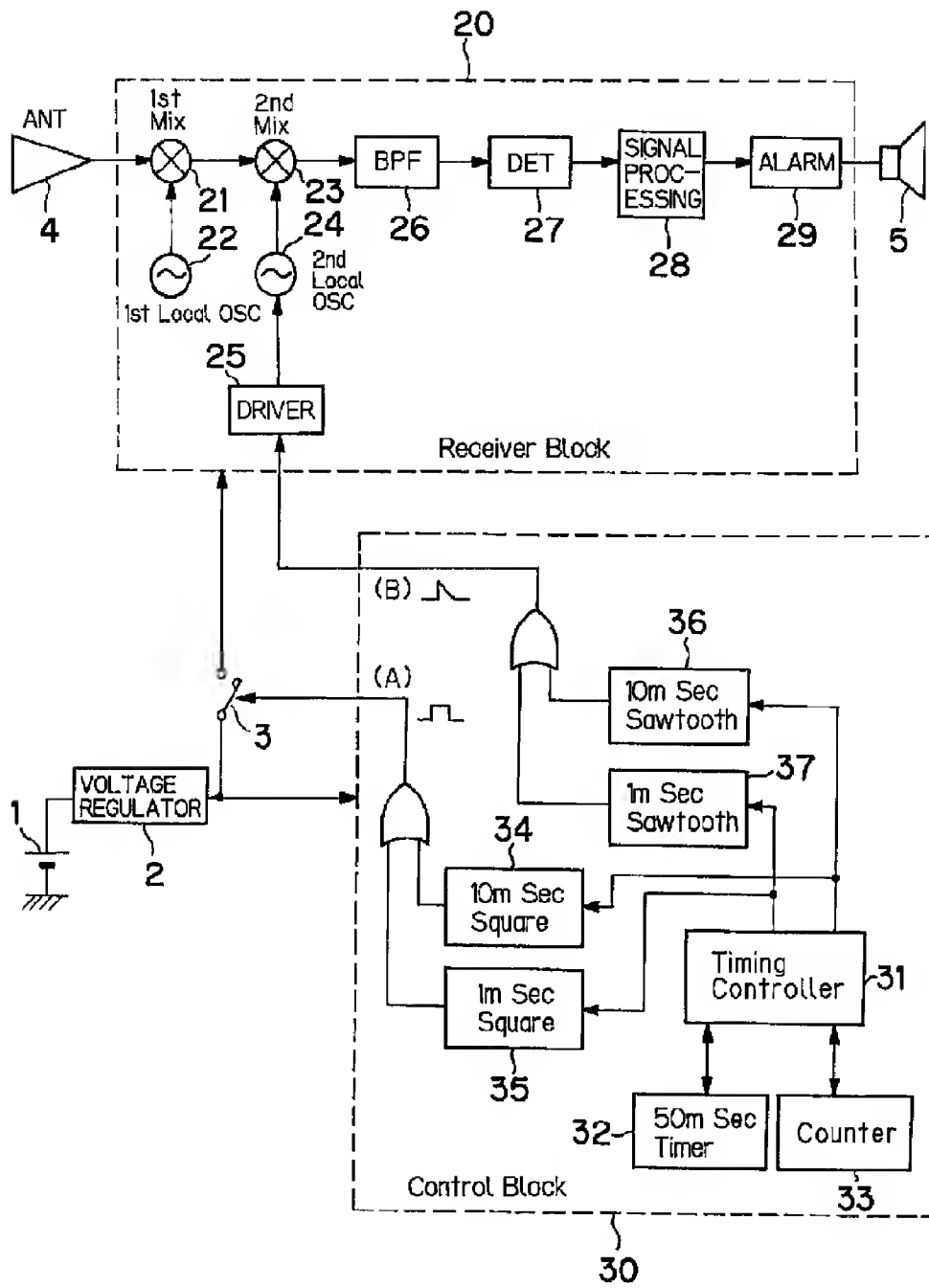
- 1 電源
- 3 給電スイッチ
- 4 ホーンアンテナ
- 24 第2局部発振器
- 25 スイープドライバ
- 31 タイミングコントローラ
- 34 10msec方形波発振器
- 35 1msec方形波発振器
- 36 10msecのこぎり波発生回路
- 37 1msecのこぎり波発生回路

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【図3】



【図1】



【図2】

